AMENDMENTS TO THE CLAIMS

1. (Currently Amended) An antenna system of the type used in a handheld electronic device, said antenna system comprising:

an antenna element; and

a ground plane comprising:

at least two conducting surfaces each having a plurality of sides defined by at least one edge;

at least one conducting strip connecting said at least two conducting surfaces for allowing current to flow between said at least two conducting surfaces; and

said strip being narrower than the width of any of said at least two conducting surfaces,

~~wherein the ground plane includes at least one gap having an open end between the at least two conductive surfaces,~~

~~wherein each of the at least two conducting surfaces are of a shape with at least four sides, and~~

wherein the ground plane is disposed in a plane substantially parallel to a plane of the antenna element; and

wherein the ground-plane contributes to the radiation performance of the antenna system by increasing a number of frequency bands of the antenna system so as to enhance a multiband behavior of the antenna system.

2. (Previously Presented) The antenna system according to claim 1, wherein said at least two conducting surfaces are on a common planar or curved surface.

3. (Previously Presented) The antenna system according to claim 1, wherein two edges of at least two conducting surfaces are placed substantially parallel to each other, and said at least one conducting strip connecting said at least two conducting surfaces is placed substantially centered with respect to the gap defined by said two substantially parallel edges.

4. (Previously Presented) The antenna system according to claim 1, wherein the ground-plane includes at least three conducting surfaces, in which one pair of any of two adjacent conducting surfaces are connected by means of at least one conducting strip, and the remaining pairs of adjacent conducting surfaces are electromagnetically connected by means of a capacitive effect or by direct contact provided by the at least a conducting strip.

5. (Previously Presented) The antenna system according to claim 4, wherein said strips are substantially aligned along a straight axis.

6. (Previously Presented) The antenna system according to claim 4, wherein said strips are not aligned along a straight axis.

7. (Previously Presented) The antenna system according to claim 1, wherein said ground-plane includes at least two conducting strips, said at least two conducting strips connecting at least two of said conducting surfaces at least at two points located at both edges of said at least two conducting surfaces.

8. (Currently Amended) The antenna system according to claim 1 wherein at least one of said at least one conducting ~~strips~~ strip is aligned along one of the edges defining an external perimeter of said ground-plane.

9. (Previously Presented) The antenna system according to claim ~~2~~ 1, said ground-plane comprising a plurality of conducting surfaces on the same planar or curved surface, wherein at least two of said conducting surfaces are connected by a conducting strip.

10. (Previously Presented) The antenna system according to claim 1, wherein each two adjacent conducting surfaces are connected by at least one conducting strip.

11. (Previously Presented) The antenna system according to claim 1, wherein all the conducting surfaces defining said ground-plane have a substantially rectangular shape, said rectangular shapes being sequentially aligned along a straight axis, each pair of rectangular shapes defining a gap between them, at least two opposite edges of at least one of said gaps being connected by at least one conducting strip.

12. (Previously Presented) The antenna system according to claim 1 wherein all the conducting surfaces defining said ground-plane have the same horizontal width and are sequentially aligned along a straight vertical axis, wherein each pair of adjacent conducting surfaces define a gap between them, wherein each pair of adjacent conducting surfaces are connected across said gap by a conducting strip, said strip being aligned along an edge of the external perimeter of said ground-plane, said edge being alternatively and sequentially chosen at the right and left sides with respect to a vertical axis crossing the center of the ground-plane.

13. (Currently Amended) The antenna system according to claim 1, wherein at least one of the at least one conducting ~~strips~~ strip connecting two of said conducting surfaces is shaped as a zigzag or meandering curve.

14. (Previously Presented) The antenna system according to claim 1, wherein at least one of the conducting surfaces or at least one of the conducting strips of said ground-plane is shaped as a space filling curve (SFC), said SFC including at least ten connected straight segments, wherein said segments are smaller than a tenth of the operating free-space wave length and are spatially arranged in such a way that no two adjacent and connected segments form another longer straight segment.

15. (Previously Presented) The antenna system according to claim 14, wherein said segments intersect at the tips of the SFC.

16. (Previously Presented) The antenna system according to claim 14 wherein the SFC includes a plurality of corners formed by each pair of adjacent segments, the plurality of corners each being rounded.

17. (Previously Presented) The antenna system according to claim 14, wherein the SFC is periodic along a fixed straight direction of space if the period is defined by a non-periodic curve that includes at least ten connected segments and no pair of said adjacent and connected segments define a straight longer segment.

18. (Previously Presented) The antenna system according to claim 14, wherein at least one portion of the antenna system is shaped as a SFC, wherein said SFC has a box-counting dimension larger than one, said box-counting dimension computed as the slope of the straight portion of a log-log graph, wherein such straight portion is a straight segment over at least an octave of scales on the horizontal axis of the log-log graph.

19. (Previously Presented) The antenna system according to claim 14, wherein the SFC comprises at least one of a Hilbert, Peano, SZ, ZZ, HilbertZZ, Peanoinc, Peanodec, or PeanoZZ curve.

20. (Previously Presented) The antenna system according to claim 14, wherein at least one of the conducting strips connecting two conducting surfaces is shaped as a SFC.

21. (Previously Presented) The antenna system according to claim 1, wherein at least two of said conducting surfaces are connected by two or more conducting strips of different length.

22. (Previously Presented) The antenna system according to claim 14, wherein at least two of said conducting surfaces define a gap, at least a portion of the gap being shaped as a SFC.

23. (Previously Presented) The antenna system according to claim 14, wherein at least half of the surface area of said ground-plane is formed by a strip, said strip being shaped as a SFC.

24. (Previously Presented) The antenna system according claim 1, wherein at least a portion of said ground-plane is a multilevel structure, said multilevel structure including a set of conducting polygons, said polygons each having the same number of sides, wherein said polygons are electromagnetically coupled by means of either a capacitive coupling or ohmic contact, wherein a contact region between directly connected polygons is narrower than half of the perimeter of said polygons in at least seventy-five percent of said polygons defining said conducting ground-plane.

25. (Previously Presented) The antenna system according to claim 1, wherein the perimeter of said ground-plane, the conducting surfaces, or both the perimeter of said ground plane and the conducting surfaces are square, rectangular, triangular, circular, semi-circular, elliptical, or semi-elliptical.

26. (Previously Presented) The antenna system according to claim 1, wherein the antenna system is included in a handheld wireless device.

27. (Previously Presented) The antenna system according to claim 1, wherein the antenna system includes a microstrip patch antenna.

28. (Previously Presented) The antenna system according to claim 1, wherein the antenna system includes a planar inverted-F antenna (PIFA).

29. (Previously Presented) The antenna system according to claim 1, wherein the antenna system includes a monopole antenna.

30. (Canceled)

31. (Canceled)

32. (Canceled)

33. (Previously Presented) The antenna system according to claim 1, wherein the antenna system includes a multiband antenna.

34. (Previously Presented) The antenna system according to claim 1, wherein the antenna system is used to provide coverage in a cellular network, a wireless local area network (WLAN) or both.

35. (Previously Presented) The antenna system according to claim 1, wherein the antenna system is mounted inside a rear-view mirror of a motor vehicle to provide coverage in a cellular network, a wireless local area network (WLAN) or both.

36. (Previously Presented) The antenna system according to claim 1, wherein the antenna system is mounted inside a keyless door lock operation device.

37. (Previously Presented) The antenna system according to claim 1, characterized in that said antenna system includes a radiating element having substantially the same shape as the ground-plane, said radiating element being located parallel or orthogonal to said ground-plane.

38. (Previously Presented) The antenna system according to claim 1, wherein the antenna system is included in a cellular telephone, a cordless telephone, a personal digital assistant (PDA), a wireless paging device, an electronic game device, or a remote control.

39. (Previously Presented) The antenna system according to claim 1, wherein the ground-plane is included in a handheld wireless device and wherein the antenna device includes a microstrip patch antenna configuration or a planar inverted-F (PIFA) antenna configuration.

40. (Previously Presented) The antenna system according to claim 1, wherein opposing edges of adjacent conducting surfaces are linear in shape and disposed one from the other in generally parallel spaced relationship.